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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/809,924

03/26/2004

Masahiro Horibe

040157

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23850

7590

03/11/2005

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EXAMINER

QUACH, TUAN N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 03/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/809,924

Applicant(s)

HORIBE ET AL.

Examiner

Tuan Quach

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/29/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claims 1-6 are elected without traverse.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. in view of Soutome et al. or Hunt.

Regarding claim 1, Nagata et al. (5,550,101) teaches a high temperature superconducting device wherein at least two Josephson junctions having different critical current densities to one another are provided on a substrate, e.g., portions 13a having a high critical current density and portions 13b having a low critical current density on the substrate 10. See the abstract, column 2 line 5-29, column 3 line 60 to column 7 line 5. Nagata et al. lacks primarily the ramp-edge recitation for the junctions

Soutome et al. (IEEE Trans. Applied Superconductivity, Vol. 11, No. 1, 3/01, pp. 163-166) teaches the use of ramp-type Josephson junctions including surface modified barriers wherein the critical current density of the junction increased with decreasing barrier thickness resulting from the surface modification or damage thereto by controlling ion beam etching and annealing the surface of the ramp-edge. See page 163, Figs. 1, 3, 6, pages 164-166.

Hunt (5,945,383) teaches a high temperature super conductor Josephson element which employs the preferred edge-geometry including deposited barrier 8. The relationship between the critical current density and the barrier thickness is also established. See Figs. 3, 8, 13 column 6 line 33 to column 7 line 65.

It would have been obvious to one skilled in the art in practicing Nagata et al. to have employed the ramp-edge Josephson junctions to form the junctions in questions since such junctions are conventional and advantageous and wherein the critical current density can be controlled by controlling barrier thickness as taught by Soutome et al. or Hunt. Regarding the barrier by damage, e.g., from surface modification or from barrier deposition correspond to a process limitation wherein here it is the patentability of the product is in question. Furthermore, the use of deposited barrier or of surfaced modified barriers correspond to two obvious alternatives to obtain the junctions of desired critical junctions as evidenced by Soutome et al. or Hunt and as such would have been obvious.

Claims 2, 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. taken with Soutome et al. or Hunt as applied to claims 1 and 4 above, and further in view of Hascicek et al. or Bradley.

Regarding claim 2, the intended use of the respective junctions for high or low speed would have been obvious since a recitation directed to the manner in which a claimed apparatus is intended to be used does not distinguish the claimed apparatus from the prior art – if the prior art has the capability to so perform. See MPEP 2114 and *Ex parte Masham*, 2 USPQ2d 1647 (1987). Additionally, such application would have further obvious, together with claim 3, in view of Hascicek et al. 5,464,813, the abstract, and Fig. 2, column 5 line 66 to column 6 line 20, evidencing the conventional application in the pulse generator, and in view of Bradley, 5,400,026, the abstract, column 1 line 5 to column 2 line 37. The use of Josephson junctions having barrier of different thicknesses would have been conventional and obvious as delineated in Soutome et al., or Hunt as delineated above.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. taken with Soutome et al. or Hunt as applied to claims 1 and 4 above, and further in view of Moeckly et al.

The references are applied as above. Regarding the interface-engineered barrier of different damages, Soutome et al. further teaches evidenced the surface-modified barriers, including by Ar ion-beam etching of the surface of the ramp edge. Additionally, Moeckly et al. 2004/0134967 teaches the relationship between conditions of plasmas to achieve junctions with desired parameters. The dependency of the

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critical current density in the interface-engineered junctions is also delineated. It was further taught that such interface-engineered junctions avoid the deposition of a barrier layer. See [0035], [0038], [0045].

Accordingly, it would have been obvious to have employed interface engineered junctions as an alternative since such is conventional and advantageous wherein deposition of a barrier can be avoided and wherein junctions with the desired parameters can be obtained as taught by Moeckly et al. The differing damages would have been obvious given the surface treatment and different annealing to obtain desired critical current density as a function of barrier thicknesses as delineated in Soutome et al. above and would have been further apparent as delineated by Moeckly et al. wherein a junction of desired parameters can be obtained by selecting conditions of plasmas.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. taken with Soutome et al. or Hunt and Hascicek et al. or Bradley as applied to claims 2, 3, 5, and 6 above, and further in view of Moeckly et al.

The references are applied as above. Regarding the interface-engineered barrier of different damages, Soutome et al. further teaches evidenced the surface-modified barriers, including by Ar ion-beam etching of the surface of the ramp edge. Additionally, Moeckly et al. 2004/0134967 teaches the relationship between conditions of plasmas to achieve junctions with desired parameters. The dependency of the critical current density in the interface-engineered junctions is also delineated. It was further taught that such interface-engineered junctions avoid the deposition of a barrier layer. See [0035], [0038], [0045].

Accordingly, it would have been obvious to have employed interface engineered junctions as an alternative since such is conventional and advantageous wherein deposition of a barrier can be avoided and wherein junctions with the desired parameters can be obtained as taught by Moeckly et al. The differing damages would have been obvious given the surface treatment and different annealing to obtain desired critical current density as a function of barrier thicknesses as delineated in Soutome et al. above and would have been further apparent as delineated by Moeckly et al. wherein a junction of desired parameters can be obtained by selecting conditions of plasmas.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sung et al. 2002/0074544 is made of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Quach whose telephone number is (571) 272-1717. The examiner can normally be reached on M - F from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.



Tuan Quach
Primary Examiner